

Behavioral Finance and how its Behavioral Biases Affect German Investors

BASTIAN SCHULZ

Abstract

The growing discipline of behavioral finance has identified several biases that significantly impact individual investors' actions. This paper aims to evaluate the influence of behavioral biases on investing decision-making among German investors. A questionnaire is created, and survey results from 342 investors are collected. Three behavioral biases, namely overconfidence, herding, and anchoring behavior, have been examined in this study. Moreover, it was determined if gender influences these biases among German investors. The findings indicate that male German investors are more susceptible to overconfidence and anchoring bias than female German investors. However, women are more likely than males to fall victim to the herding bias. Overall findings show that individual investors are prone to psychological mistakes.

Keywords

Behavioral economics, behavioral finance, behavioral biases, overconfidence, anchoring, herding

JEL Classifications

G4, D91

DOI

<http://dx.doi.org/10.37355/acta-2023/1-03>

Introduction

The efficient market hypothesis is the cornerstone of traditional finance, and this theory allows investors to access market data and asset values (Madaan & Singh, 2019). According to the efficient market hypothesis, the stock price always properly represents all general information, and the stock market is always faultless and efficient (Putri et al., 2021). According to the efficient market hypothesis, no one can consistently beat the market and achieve a better long-term return.

Furthermore, traditional finance implies that capital markets are efficient and investors are rational (Fama, 1998). Investors decide to reduce costs and enhance benefits (Ahmad et al., 2018). The field of traditional finance has developed steadily, yet, it is still challenging to provide a scientific justification for why people act irrationally when dealing with money. People can only sometimes access all the necessary information to make potential judgments (Barberis & Thaler, 2003; Kinoshita et al., 2013). Numerous

research has questioned rationality, leading to the development of behavioral finance (Tversky & Kahneman, 1971). The disparity between how people make judgments that result in benefits and ones that result in losses can be explained by behavioral biases (Tversky & Kahneman, 1973). Behavioral finance posits that numerous behavioral biases impact investment decision-making, causing investors to depart from rationality and make irrational investment decisions (Niehaus & Shrider, 2014). The same person who is risk-averse to a decision that involves benefits becomes a risk-taker for a decision that avoids losses (Tversky & Kahneman, 1973). According to Shefrin and Thaler (1988), several biases, including overconfidence, herding, anchoring, cognitive dissonance, availability bias, self-attribution, mental accounting, framing, and representative bias, have a substantial impact on how individual investors make decisions (Singh & Nag, 2016).

The research on behavioral finance and biases is limited to non-existent in Germany, which explains the research gap and the need for this article. Therefore, the article aims to determine whether German investors are prone to behavioral biases and whether there are differences in genders' propensity for behavioral biases. The article is organized as follows. The first chapter shortly describes the field of behavioral finance and mainly the investigated biases (overconfidence, herding, anchoring), the second one the methodology. Results are presented in the third chapter and discussed in the fourth one. Conclusion summarizes main points.

1 Behavioral finance and behavioral Biases

Behavioral finance is distinct from traditional finance, predicated on expectations of how markets and investors would act (Pompian, 2012). Behavioral finance studies how psychology influences financial markets and decision-making (Shefrin, 2001). According to Thaler (1999), behavioral finance's assumptions begin to function in various situations since traditional finance theories cannot provide a solution. Behavior finance incorporates the importance of what investors should do and combines the fundamentals of traditional finance with what people do in terms of their investment decisions (Mitroi & Stancu, 2014). Behavioral finance is the study of the impact of psychological variables on the evolution of financial markets (Bogdan et al., 2018). In other words, the inefficiency of financial markets is examined through the lens of psychological ideas and viewpoints (Pompian, 2012). It is a new, high-impact paradigm offering an intriguing alternative to traditional finance. Within the subject of research of behavioral finance, the disciplines of psychology and sociology are seen as essential accelerators (Shiller, 1999). In addition to studying investor behavior rationally, behavioral finance examines various illogical psychological investing biases that traditional finance ignores (Sharma, 2016).

Biases, overconfidence, emotion, and social factors are only a few examples of the psychological foundations of behavioral finance (Kahneman & Tversky, 2013). Thaler (1980) contends that investors engage under the impact of behavioral biases, which frequently result in less-than-ideal outcomes, rather than considering investors operating rationally. For all investors, understanding why they make particular financial decisions or how they are likely to respond in typical situations of uncertainty is crucial when adopting the stance

of an investor (Bogdan et al., 2018). People have cognitive biases and limits that prevent them from making entirely rational decisions (Ahmad et al., 2017).

Biases are inclinations or tendencies that affect how investors behave. An investor, biased toward a company because he likes its spokesperson, could be influenced when deciding to buy the stock as an investment, overriding other factors that might be more essential to the stock's potential financial future. It is crucial to remember that each investment selection option has some level of risk and uncertainty while making individual investment decisions (Slovic, 1972). Many biases frequently influence both the behavior of the financial markets and the judgments made by people. Due to time restrictions and limited brain capacity, people tend to use shortcuts, which may be linked to this. Several scholars have tried to categorize these biases into different groups. However, because these biases have been usually evaluated in isolation, potential interactions or connections between them have been mainly overlooked (Agrawal, 2012). By considering these interconnections and creating a conceptual framework that includes the antecedents or causes of the biases and their outcomes or consequences, this research tries to present a comprehensive picture of behavioral biases. With this information, they create accurate predictions about what will happen, enabling them to make the best financial decisions (Fama, 1970; Jensen, 1978).

Since Tversky and Kahneman's (1974) pioneering work, the number of biases found by behavioral scientists has grown, heralding a behavioral revolution in economics, management, and the social and human sciences (Flyvbjerg, 2021). Psychologists contended that, while biases are well known, it is challenging to mitigate their impact (Pronin et al., 2002). In their study, Chen et al. (2007) discovered that several biases impact 43% of investors. Moreover, in his study on biases development, Lin (2011) claimed that individual investors are primarily interested in biases' potential repercussions.

In this study, three behavioral biases have been used to examine the effects of these biases on the way German investors make investing decisions. This approach indicates a desire to investigate numerous behavioral biases using the framework of the behavioral finance field. The following behavioral biases are addressed in this study:

- Overconfidence bias
- Herding bias
- Anchoring bias

1.1 The overconfidence bias

Overconfidence is a psychological characteristic in behavioral finance that significantly influences individual investing decisions. These choices might be stock market investments or other types of investments (Joo & Durri, 2017). Overconfidence is a prevalent psychological bias in behavioral finance, and it causes financial markets inefficient by causing mispricing in the form of enormous volatility and return variability (Odean, 1998;

Ko & Huang, 2007). Overconfidence is a judgment mistake whereby people exaggerate their competence, knowledge, perception of information, or subjective likelihood that a specific outcome will occur (Campbell et al., 2004; Glaser & Weber, 2010). Investors overreact because they are overconfident in comprehending or absorbing information (Fischoff et al., 1977; Ricciardi & Simon, 2000; Daniel et al., 2002; Pompian, 2011; Zahera & Bansal, 2018; Park, 2023). According to the researchers, overconfidence bias is frequently caused by ignoring unknowns (Walters et al., 2017). Nearly all the repercussions of overconfidence are unfavorable regarding stock investing (Fieger, 2017).

Women are reportedly less confident than males in investing in the financial markets (Bayyurt et al., 2013). Further studies indicated that males are more susceptible to this because they seem overconfident in their capacity to trade and sell one and a half times as much as women supported this (Kliger et al., 2014; Liersch, 2015).

Example:

Aeropostale was one of the initial equities a Danish shareholder purchased when he began stock trading. The stock had plummeted dramatically, and the firm was in peril. He decided to acquire them because he thought they would increase again. The stock initially decreased for approximately a year until some encouraging news broke. He kept buying, and the stock increased, delivering him a 30% gain in weeks. However, the stock then quickly changed course. He maintained most of the stock in his portfolio and sold a modest amount to make a profit. After one year, the investment had decreased by nearly 90%, and the stock had practically lost its value (Rasmussen, 2017).

An overconfident Danish investor loses practically all of his investment since he cannot realize his gains due to his excessive faith in his capacity to access the market.

H1: Male German investors are less likely than female German investors to succumb to the overconfidence bias.

1.2 The herding bias

Herding is a typical occurrence in the financial market. Herding is described as behavior patterns common among individuals and can cause communities to make consistently bad decisions (Devenow & Welch, 1996). According to Cote and Sanders (1997), herding is modifying one's personal opinions to better align with those of others. During the irregular state of financial markets, it is a common human instinct to refer to, watch, and copy the conduct of others (Yu et al., 2018). Investors do not make rational investing decisions when herding is present, and they like to base their investment decisions on the beliefs and views of other investors. As a result, when investors herd, they tend to limit their own decisions and follow others.

Herding is mainly caused by the availability or absence of knowledge and an innate lack of trust in one's information (Venezia et al., 2011; Sinha, 2015; Fieger, 2017). There is also much evidence to suggest that herding is a sort of social control in humans, where people

want to connect with others and feel better about themselves when their behavior is in line with that of their friends (Andersson et al., 2014; Roeder & Voskort, 2016; Spyrou, 2013). An individual finds more satisfaction in the herd's errors as a whole than in the errors of a single member (Ahmad & Mahmood, 2020).

It is also described as imitative behavior that results in associated patterns of conduct that are not rational and unsupported by core principles (Gleason et al., 2004; Hirshleifer & Hong Teoh, 2003; Babalos et al., 2015). The herding effect is more pronounced when market distress factors are present, such as anomalies in the market, price bubbles, and rumors (Mertzanis & Allam, 2018). Herding has been described as a confluence of motions caused by collective imitation (Philippas et al., 2013). Several research articles have demonstrated that herding behavior might lead to comparable movement patterns among individuals and significant welfare losses.

There is disagreement in the literature about which gender is more prone to the herding bias.

Kumar and Goyal (2016) investigated the link between rational decision-making and behavioral biases among Indian individual investors. The findings show that male investors in India are more prone to herding bias. However, Zainul and Suryani (2021) discovered in their study that female investors in Indonesia are more likely to fall prey to the herding tendency while making financial decisions. On the contrary, Jamil and Khan (2016) observed that male and female investors in Oman are equally prone to herd behavior, demonstrating that the investor's gender does not influence the investor's herd behavior.

Example:

As a young guy fresh out of college with money saved from his first paychecks, an American stockholder was enthusiastic about investing in stocks. He listened to a portfolio manager give his finest stocks on "Wall Street Week" with Louis Rukeyser. He took a mental note of one of them since it piqued his interest. Furthermore, he placed his order over the phone right away. The following Monday, when the market opened, he bought his first share, only to watch as it rapidly fell in value over the ensuing weeks. He needed to learn more about the prospects or worth of the firm before deciding whether to hold or sell the stock. As a 22-year-old, he had had enough and sold the shares for a loss of a few hundred dollars (Saldanha, 2021).

Herding bias affects an American investor as he blindly believes a so-called expert without conducting any independent investigation.

H2: Female and male German investors are equally prone to herd behavior.

1.3 The anchoring bias

Anchoring is among the best-studied psychological biases (Shin & Park, 2018). Anchoring bias influences investors' decisions (Wright & Anderson, 1989). It is known as the notion

that an originally offered value might influence decision-makers in favor of that value (Furnham & Boo, 2011). Anchoring is a cognitive bias that explains why the average person tends to rely heavily on the initial information while making judgments (Singh, 2016; Shin & Park, 2018; Ahmad et al., 2018).

Campbell and Sharpe (2009) found significant evidence that professionals participating in financial market forecasting were primarily anchored to historical data, especially recent data. Although anchors produced from an investor's knowledge are acknowledged to be imperfect, those generated from an external source are taken seriously at first (Epley & Gilovich, 2001).

Studies have shown that anchoring has a detrimental effect on the investment choices made by investors (Ahmad et al., 2018). When investors place an inordinate amount of importance on a superficial reference point that is statistically random and emotionally driven, they suffer from anchoring bias, which leads them to make poor judgments (Fieger, 2017; Tseng & Yang, 2011; Liang & Qamruzzaman, 2022). The investor then exploits the gains and losses relative to the benchmark, which is also the stock's selling price (Duxbury, 2015). Moreover, according to the literature, women are more susceptible to the anchoring bias than men (Owusu & Laryea, 2022; Kudryavtsev & Cohen, 2011).

Example:

One morning, when the market showed weakness, an Indian investor started a short position on the Bank Nifty. As a result, he took a short position at 35,300 but sold it too soon since he was not sure the market would fall.

Though he noticed the price of this option lowering, his mind was not ready to enter the trade at a lower price than 35,300, even after the market continued to exhibit symptoms of weakness (VRD Nation, 2021).

An Indian investor is susceptible to anchoring bias as he concentrates on a single reference point. He is aware that he oversold his position and is reluctant to return at this point because his former position was considerably larger.

H3: Female German investors are more susceptible than male German investors to be victims of the anchoring bias.

2 Methodology

A questionnaire is used to collect the data for this paper. The questionnaire, a set of questions provided to interview participants or survey respondents to obtain data suitable for analysis, is a crucial quantitative instrument in empirical research (Acharya, 2010). It is the most often used technique of getting information due to its low cost and wide application (Maier et al., 2000). When quickly acquiring information from a large group of people, questionnaires are an excellent option since they are a fantastic way to record their

opinions and thoughts. The questionnaire's standardization is essential. The same questions are asked, and the replies are coded consistently in a standardized questionnaire. This procedure ensures that the answers to the questions may be interpreted as representing fluctuations in the respondents' behavior (Siniscalco & Auriat, 2005). The questionnaire is accessible on conventional paper, online, and on computers. Therefore, data from several sources may be rapidly compared (Kirchhoff et al., 2010). So, it is more interested in winning something that has yet to be created. Information stimulates people to react.

For the study, an online survey was utilized. The average processing time and the number of pages were previously included in the welcome paragraph at the start of the questionnaire to prevent a high dropout rate and provide transparency to the respondents. However, many investors are in the population and only a tiny sample of people needed to be polled. So, the sub-survey units were precisely selected based on the known characteristics of the population (Homburg, 2017).

1. Investors who trade actively or passively.
2. Investors were required to trade on the German stock exchange.
3. The participants understood English.

The replies' compliance with the standards for the broader public was strictly monitored. The target audience for the study was reached through two methods:

- Professional Network: Considering the specified population, the link to the questionnaire was targeted and delivered to the professional network.
- Private Network: The link to the survey was sent to the personal network through email and WhatsApp. The network consisted of friends, family, and other doctorate students.

The questionnaire asked participants to choose the best and worst statements describing their investing decisions among several biases. As a result, the study assessed the behavioral biases prevalent in German investors' judgments based on their responses to the questions. The selections will be compared across genders to see if there are any differences. The mean value, represented among the biases in percentages, will be used by the author to compare the results.

3 Results

The study's 342 participants included 181 male and 161 female German investors. The participants were also divided into age groups. With 121 replies, the age group of 25–34 years was the largest among all age groups, while the age group of over 70-year-olds was the smallest, with five people. The table below shows the age groups and gender as demographic factors for this study.

Table 1: Investor’s demographic profile

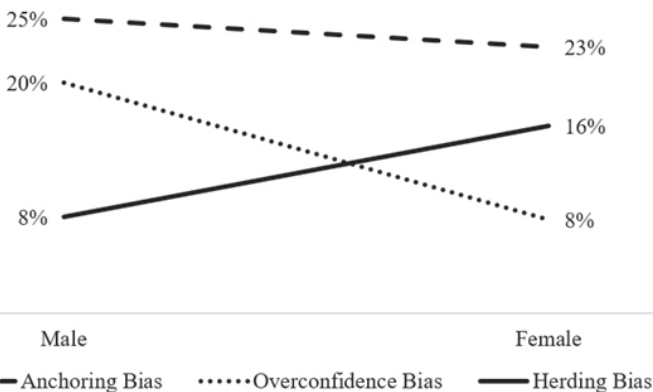
Demographic variables	Participants (in total)	Participants (%)
Age		
18–24 years	37	11%
25–34 years	121	35%
35–44 years	101	30%
45–59 years	60	18%
60–69 years	18	5%
>70 years	5	1%
Gender	342	
Male	181	53%
Female	161	47%

Source: Own illustration

The article will solely focus on gender as a demographic factor. After the presentation of the demographic factors, the behavioral biases discussed in Chapter 1 and how they were placed in relevance among German investors will be addressed. Before the three biases are assessed independently, they are first reviewed together.

The 342 German investors were asked to select one statement from a list of several statements about different biases that best represent their investment choice in the questionnaire. Their choice among the three biases is depicted in the following figure.

Figure 1: Which statement does describe your investment behavior?

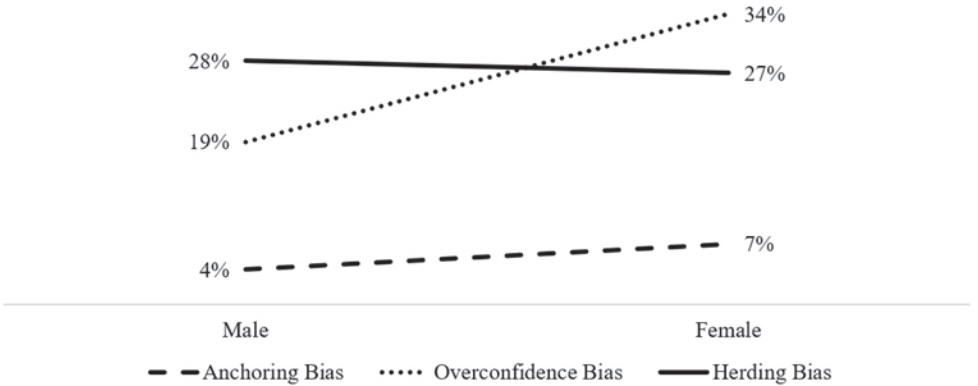


Source: Own illustration

The graph demonstrates that both genders have the most substantial anchoring bias. It is also evident that while the overconfidence bias affects women the least, the herding bias affects males the least.

The following figure shows the statement German investors chose when asked about the statement that does not describe their investment behavior.

Figure 2: Which statement does not describe your investment behavior?

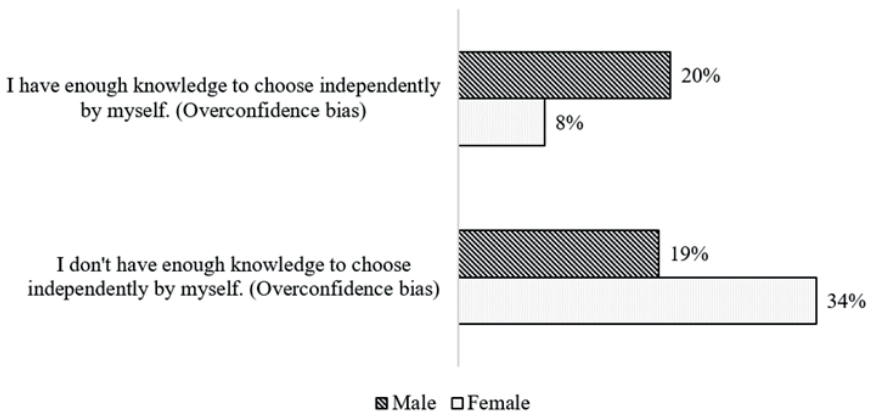


Source: Own illustration

The graph illustrates that there is, once again, an agreement between the two genders on the anchoring bias. Both genders chose this in the last place. Men and women chose differently here about the statement that did not characterize either gender's investment activity, just as they did before regarding the statement detailing investment behavior. Thus, while describing a statement that does not describe their investment behavior, women picked the overconfidence bias first, whereas men chose the herding bias. It is clear from the two images that both genders have the strongest propensity for anchoring bias. There is no consensus on the least preferred bias, which is the herding bias for males and the overconfidence bias for females. As previously stated, the next step is to evaluate each of the three biases independently.

The overconfidence bias will be examined first. Figure 3 shows how genders rated the overconfidence bias.

Figure 3: Overconfidence bias – Gender



Source: Own illustration

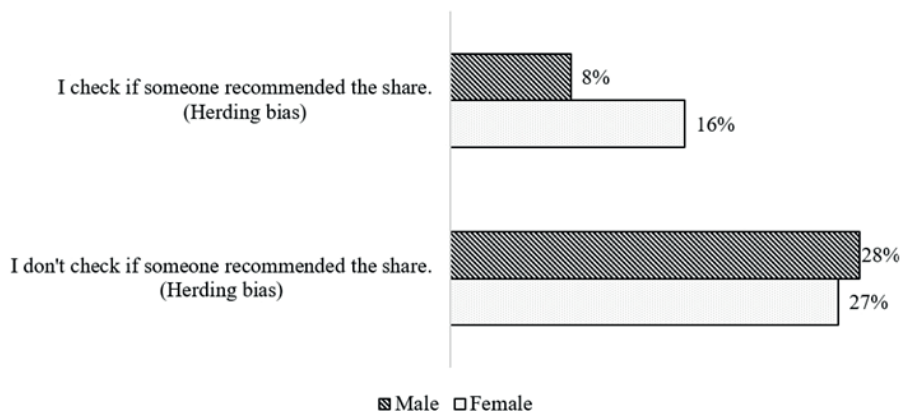
Figure three shows that males agree more with the statement about the overconfidence bias. When asked to explain their investment behavior, 20% of German male investors picked this statement, compared to 8% of female investors. In order to test this, respondents were also asked to choose a statement that did not describe their investing behavior. In this case, 34% of female German investors judged the statement concerning the overconfidence bias not to match their investment behavior, whereas 19% of men did. The findings support the research discussed in Chapter 1.1 regarding the overconfidence bias and show that males are more susceptible to the overconfidence bias than women.

H1: Male German investors are less likely than female German investors to succumb to the overconfidence bias.

Hypothesis 1 can be verified as men are more susceptible to the overconfidence bias than women among German investors.

The herding bias and how the respondents felt about it will next be examined. Figure 4 displays the results.

Figure 4: Herding bias – Gender



Source: Own illustration

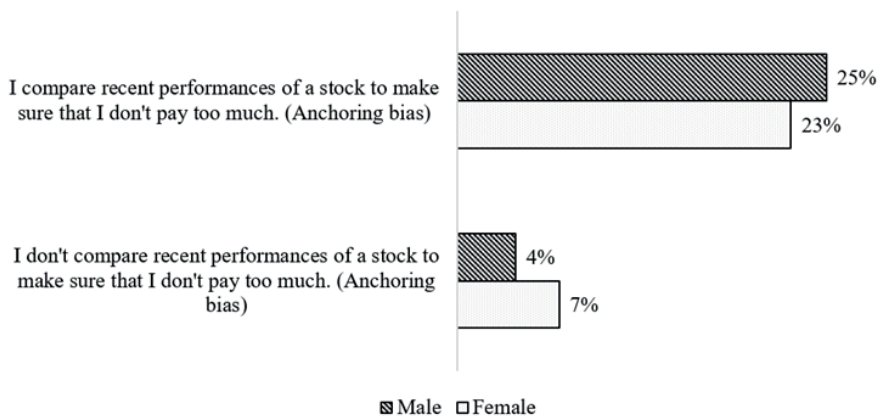
The statement defining the herding tendency was chosen by 16% of the female and 8% of the male investors among the German investors to be consistent with their investment behavior. Hence, there is a distinct preference for female German investors regarding herding bias. However, what about the investment behavior that does not describe German investors' investment behavior? The initial expectations were validated, as 28% of male investors and 27% of women picked the statement concerning the herding tendency not to characterize their investment behavior. Nevertheless, these data do mildly corroborate the earlier conclusions concerning herding bias since fewer women than males participated in the study, implying a more significant percentage disparity between the results could be expected. Nevertheless, if not with conviction, women's propensity for herding is more significant.

H2: Female and male German investors are equally prone to herd behavior.

Hypothesis 2 can be falsified, as the tendency was proven higher for female German investors than male German investors regarding the herding bias.

Lastly, the anchoring bias and its tendency among genders were reviewed. The results are shown in figure 5.

Figure 5: Anchoring bias – Gender



Source: Own illustration

According to the data, male German investors, with 25%, have a more significant potential for anchoring bias than female German investors, with 23%. Looking at the statement that does not explain the respondent's investing behavior further confirms these results. Compared to just 4% of males, 7% of female German investors chose the anchoring bias not to reflect their investment behavior.

H3: Female German investors are more susceptible than male German investors to be victims of the anchoring bias.

Hypothesis 3 can be rejected since male German investors are more prone to the anchoring bias than female German investors.

To conclude, the data revealed that the anchoring bias was the strongest propensity for both genders. However, regarding the least favorable bias, women selected the overconfidence bias, but men chose the herding bias. Among the three behavioral biases, males were more prone to anchoring bias and overconfidence bias, while females were more prone to herding bias.

4 Discussion

The findings from the last chapter will be discussed next, starting with the overconfidence bias before moving on to the herding bias and finishing with the anchoring bias.

4.1 The overconfidence bias

The research showed that males had a higher score for the overconfidence bias among German investors than women.

These results align with those of Lewellen et al. (1977), who found that men are more likely than women to be overconfident. Men are more overconfident than women, according to studies by Bruce and Johnson (1994), Barber and Odean (2001), Bhandari and Deaves (2006), Bayyurt et al. (2013), Kliger et al. (2014), Liersch (2015), Baker et al. (2018), and Metawa et al. (2018). Men also appear more overconfident in their trading ability, as they sell one and a half times more than women. These findings were further supported by Bakar and Ng (2016), who found that gender influences overconfidence and other behavioral biases among 200 Malaysian stock market participants between the ages of 18 and 60. In their study of whether a demographic profile affects investor behavior, Chitra and Jayashree (2014) revealed that individual investors suffer from psychological and emotional biases. Overconfidence, for example, has an impact on investor behavior. Apart from these biases, the researchers observed that gender interacts with behavioral factors in investment decisions. When Jaya (2014) investigated the influence of investors' behavioral biases on the Indian equities market, he observed that men are more overconfident than women—based on primary data from 309 respondents, Mishra and Metilda (2015) revealed that men are more overconfident than women among mutual fund investors in India.

According to other studies, there is no difference in the tendency for overconfidence between men and women. Hardies et al. (2011) used the mean and standard deviation to analyze primary data from 597 respondents to determine whether there is a gender difference in overconfidence within the auditor population. No evidence of a gender disparity among auditors was revealed during their study. In their study, Alquraan et al. (2016) found that behavioral finance traits like overconfidence significantly affect individual investors' stock investing choices on the Saudi Stock Exchange. In contrast, demographic factors like gender had little impact on investors' choices.

Moreover, this supports the finding of research by Kansal and Singh (2018) that the degree of overconfidence is unaffected by gender. Bashir et al. (2013) conducted a study with 100 graduate and postgraduate students and staff at the University of Gujarat (Pakistan). When it comes to overconfidence bias, this study revealed that there is no noticeable difference between male and female decision-making.

According to other studies, women exhibit greater overconfidence than males do. In an experiment by Fernandes et al. (2012), 92 students from the Universidade Católica de Brasil took part to investigate the effects of group influence on investment decisions and discover a connection between the two financial behavior tendencies of overconfidence and herding behavior. The results revealed that acting in a group tended to lower overconfidence and

that women expressed stronger overconfidence than males, even if this impact was not highly significant. Also, it was shown that the performance of the two genders together was more rational than when they performed separately. Kartašova (2013) discovered that female investors are more overconfident than male investors in the Lithuanian stock market.

4.2 The herding bias

The research showed that females are more prone to herding bias among German investors than men.

These results do align with Zainul and Suryani (2021), who discovered in their study that female investors in Indonesia are more likely to fall prey to the herding tendency while making financial decisions. Zheng et al., 2021 researched the herding tendency of individual Chinese investors using a unique dataset from a significant anonymous brokerage firm. According to empirical data, female investors in the Chinese stock market herd more frequently than male investors. From the behavioral finance literature, Rajdev and Raninga (2016) examined the variations in heuristic biases based on gender. Based on their personality characteristics and gender psychology, male and female investors display distinct behavioral biases, according to an examination of the literature. They discovered that female investors exhibit a stronger propensity for the herding bias than males.

The results contrast the findings by Kumar and Goyal (2016). In order to examine the impact of demographic factors on rational decision-making processes and how those differences manifest themselves in the form of behavioral biases, Kumar and Goyal (2016) looked at the relationship between rational decision-making and behavioral biases among individual investors in India. A total of 386 valid replies to a structured questionnaire have been gathered. The results demonstrate that male investors in India are more susceptible to the herding tendency. In order to determine if and to what extent the U.S. and Nigeria exhibit different behavioral biases, Wong and Nwude (2018) examined seven psychological biases in both nations. A survey is used to gather data. Only U.S. findings were included when comparing the herding bias between the two nations, and the impact of the herding bias on gender was explored. The findings indicate that American males have a more significant herding effect than American females.

On the contrary, Jamil and Khan (2016) observed that male and female investors in Oman are equally prone to herd behavior, demonstrating that the investor's gender does not influence the investor's herd behavior. Yuliawati et al. (2021) explored variations in investing bias depending on gender among Indonesian investors. Respondents in this study were 35 male investors and 30 female investors in the Indonesian capital market. The data found that female and male investors engaged in moderate amounts of herding. The findings of hypothesis testing revealed no significant variation in the amount of herding between the two genders. Talpsepp and Tänav (2021) utilized a dataset that included all real estate transactions from 2004 to 2012 from the Estonian government's official land register. The capital of Estonia, Tallinn, has the most liquid real estate market. Thus, they concentrated on residential home transactions there. Gender-based herding is not observed in real estate purchases. Herding was one of eight behavioral biases that Alrabadi et al. (2018) looked at

in the Amman Stock Market and its impact on investing success. Two hundred forty-two stock market investors in Amman were given a questionnaire, which was made. According to the findings, there are no statistically significant differences between males and females.

4.3 The anchoring bias

The findings showed that male German investors are more prone to the anchoring bias than female German investors.

These findings contrast with Owusu and Laryea's (2022) findings, which investigated how gender differences in anchoring influence investor decision-making dynamics regarding mutual funds. The results demonstrate that investors were generally susceptible to being considerably impacted by the anchoring bias, and it was shown that females were more likely to anchor than males. From behavioral finance research, Rajdev and Raininga (2016) examined the variations in heuristic biases based on gender. Based on their personality characteristics and gender psychology, male and female investors display distinct behavioral biases, according to an examination of the literature. Compared to males, female investors are more prone to anchoring bias. In particular, the disparities between genders in the strength of these biases were examined in Kudryavtsev and Cohen's (2011) analysis of the anchoring bias's function in the perception of economic and financial information. They experimented with several MBA students. According to the results, women are more susceptible to the anchoring bias than males. Individual investors' use of emotion and anchoring biases in making financial decisions were examined by Fernandes et al. (2014). Verifying if the gender component (male and female) interferes with the presence of this prejudice was another parallel aim. They discovered that women in this group were marginally more anchored when considering the findings of an inventive experiment. When consumers appraise and estimate the price of a product in experiencing scenarios, Zong and Guo (2022) performed an experimental study to investigate the presence of the anchoring effect and the elements that influence it. The results show that female consumers are more significantly impacted by the anchoring effect than male consumers.

Conclusion

This paper examined the impact of behavioral biases on investment decisions made by German investors. The overconfidence bias, herding bias, and anchoring bias were the behavioral biases that this study concentrated on. The behavioral biases were discussed and assessed using a questionnaire distributed to 342 German investors. The issue was whether gender influences behavioral biases and hence investing decisions made by German investors. The study's findings indicate that behavioral biases impact German investors. Also, this study demonstrated that male and female German investors had varied tendencies towards certain behavioral biases, demonstrating that behavioral biases do not equally impact genders. The findings revealed that women are more prone to herding bias than males. However, regarding overconfidence and the anchoring bias, male German investors are more vulnerable than female German investors.

The recent study further stressed that financial market participants' decision-making processes are not rational. An investor's subconscious mind is firmly embedded with biases, which affect practically every decision he makes. In order to assist individual investors in dealing with these biases, behavioral finance aims to deal with them.

It has also been demonstrated that biases among investors greatly influence how individuals spend, save, and invest. These biases are caused by the brain's shortcuts while processing information and by the emotional structure of society. Because of this, most investors suffer from the occurring biases, which lead them to act negatively, which may work against their best interests.

Additionally, the market fluctuations caused by the pandemic and inflation crisis demonstrate that investor behavior varies over time, making this research extremely difficult to do to gain a better knowledge of investor behavior. Moreover, investor behavior can be influenced by various circumstances that influence an investment or trading choice. As a result, factors such as the sector of the traded stock and the business cycle, among others, appear to influence investing behavior. It is thought that some biases feed off of one another, and the external environment and other biases in the process are two elements that affect bias intensity. However, although certain biases can be avoided in particular situations, they cannot be removed entirely.

The paper claims that behavioral biases have impacted human judgment, and further studies could also investigate different biases and demographic variables. It can also be argued that, for some reason, it can be challenging to make financial judgments, which can occasionally cause many individuals to act irrationally. The same people, however, are more likely to be at ease and in a better frame of mind while filling out a questionnaire, so they choose to react in a way that may paint them in a different light, especially in the context of questions that provide hypothetical scenarios.

The findings in this article can be helpful for investors in Germany and elsewhere to invest more thoughtfully and to be aware of the possibility of falling victim to behavioral biases in mind as it was shown in this article by the examples and results that investors tend to be irrational, so raising awareness of behavioral finance can assist in reducing unintentional mistakes and taking advantage of opportunities.

Bibliography

- Acharya, B.** (2010). Questionnaire Design. Lalitpur Central Department of Population Studies. Tribhuvan University, Nepal.
- Agrawal, K.** (2012). A Conceptual Framework of Behavioral Biases in Finance. *The IUP Journal of Behavioral Finance*, 9(1), 7–18.
- Ahmad, M., Shah, S. Z. A., Mahmood, F.** (2018). Qualitative research in financial markets. *Asian Review of Accounting*, 18(1), 52–114.
- Ahmad, M. U. & Mahmood, A.** (2020). An empirical study on herd mentality in Indian investors. *JIMS8M: The Journal of Indian Management & Strategy*, 25(3), 58–61.
- Alrabadi, D. W. H., Al-Abdallah, S. Y., Aljarayesh, N. I. A.** (2018). Behavioral biases and investment performance: Does gender matter? Evidence from Amman Stock Exchange. *Jordan Journal of Economic Sciences*, 5(1), 77–92.
- Andersson, M., Hedesstrom, M., Garling, T.** (2014). A social-psychological perspective on herding in stock markets. *Journal of Behavioral Finance*, 15(3), 226–234.
- Babalos, V., Balcilar, M., Gupta, R.** (2015). Herding behavior in real estate markets: novel evidence from a Markov-switching model. *Journal of Behavioral and Experimental Finance*, 8, 40–43.
- Barberis, N. & Thaler, R.** (2003). A survey of behavioral finance. *Handbook of the Economics of Finance*, 1, 1053–1128.
- Bayyurt, N., Karişik, V., Coşkun, A.** (2013). Gender Differences in Investment Preferences. *European Journal of Economic & Political Studies*, 6(1), 71–83.
- Bhandari, G. & Deaves, R.** (2006). The demographics of overconfidence. *The Journal of Behavioral Finance*, 7(1), 5–11.
- Bogdan, V., Meşter, I. T., Matica, D.** (2018). Insights into some psychological triggers that affect judgments, decision-making and accounting choices. *Economic research-Ekonomska istraživanja*, 31(1), 1289–1306.
- Campbell, W. K., Goodie, A. S., Foster, J. D.** (2004). Narcissism, confidence, and risk attitude. *Journal of behavioral decision making*, 17(4), 297–311.
- Campbell, S. D. & Sharpe, S. A.** (2009). Anchoring bias in consensus forecasts and its effect on market prices. *Journal of Financial and Quantitative Analysis*, 44(2), 369–390.
- Chen, G., Kim, K. A., Nofsinger, J. R., Rui, O. M.** (2007). Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors. *Journal of behavioral decision making*, 20(4), 425–451.
- Cote, J. & Sanders, D.** (1997). Herding behavior: Explanations and implications. *Behavioral Research in Accounting*, 9.
- Daniel, K., Hirshleifer, D., Teoh, S. H.** (2002). Investor psychology in capital markets: Evidence and policy implications. *Journal of monetary economics*, 49(1), 139–209.
- Devenow, A. & Welch, I.** (1996). Rational herding in financial economics. *European economic review*, 40(3–5), 603–615.
- Duxbury, D.** (2015). Behavioral finance: insights from experiments II: biases, moods and emotions. *Review of Behavioral Finance*, 7(2), 151–175.

- Epley, N. & Gilovich, T.** (2001). Putting adjustment back in the anchoring and adjustment heuristic: Differential processing of self-generated and experimenter-provided anchors. *Psychological science*, 12(5), 391–396.
- Fama, E. F.** (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of financial economics*, 49(3), 283–306.
- Fernandes, J., Matsumoto, A., Chagas, P., Ferreira, I.** (2014). Behavioral Finance: A study of affect heuristic and anchoring in decision making of individual investors. *Journal of International Business and Economics*, 14(1), 59.
- Fieger, J.** (2017). Behavioral Finance and Its Impact on Investing. *Senior Honors Theses*. 682.
- Fischhoff, B., Slovic, P., Lichtenstein, S.** (1977). Knowing with Certainty: The Appropriateness of Extreme Confidence. *Journal of Experimental Psychology*, 3(4), 552–564.
- Flyvbjerg, B.** (2021). Top ten behavioral biases in project management: An overview. *Project Management Journal*, 52(6), 531–546.
- Furnham, A. & Boo, H. C.** (2011). A literature review of the anchoring effect. *The Journal of Socio-Economics*, 40(1), 35–42.
- Glaser, M. & Weber, M.** (2010). Overconfidence. Behavioral finance: *Investors, corporations, and markets*, 241–258.
- Gleason, K. C., Mathur, I., Peterson, M. A.** (2004). Analysis of intraday herding behavior among the sector ETFs. *Journal of Empirical Finance*, 11(5), 681–694.
- Hirshleifer, D. & Hong Teoh, S.** (2003). Herd behaviour and cascading in capital markets: A review and synthesis. *European Financial Management*, 9(1), 25–66.
- Homburg, C.** (2016). *Marketingmanagement: Strategie-Instrumente-Umsetzung Unternehmensführung*. Springer-Verlag.
- Jamil, S. A. & Khan, K.** (2016). Does gender difference impact investment decisions? Evidence from Oman. *International Journal of Economics and Financial Issues*, 6(2), 456–460.
- Jensen, M. C.** (1978). Some anomalous evidence regarding market efficiency. *Journal of financial economics*, 6(2/3), 95–101.
- Joo, B. A. & Durri, K.** (2017). Influence of overconfidence, optimism and pessimism on the rationality of the individual investors: An empirical analysis. *Pacific Business Review International*, 9(12), 7–13.
- Kahneman, D. & Tversky, A.** (1973). On the psychology of prediction. *Psychological review*, 80(4), 237.
- Kinoshita, K., Suzuki, K., Shimokawa, T.** (2012). Evolutionary foundation of bounded rationality in a financial market. *IEEE Transactions on Evolutionary Computation*, 17(4), 528–544.
- Kirchhoff, S., Kuhnt, S., Lipp, P., Schlawin, S.** (2010). *Der Fragebogen*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Kliger, D., van den Assem, M., Zwinkels, R.** (2014). Empirical behavioral finance. *Journal of Economic Behavior and Organization*, 107(Part B), 421–427.
- Ko, K. J. & Huang, Z. J.** (2007). Arrogance can be a virtue: Overconfidence, information acquisition, and market efficiency. *Journal of Financial Economics*, 84(2), 529–560.

- Kudryavtsev, A. & Cohen, G.** (2011). Behavioral biases in economic and financial knowledge: Are they the same for men and women? *Advances in Management & Applied Economics*, 1(1), 15–52.
- Kumar, S. & Goyal, N.** (2016). Evidence on rationality and behavioural biases in investment decision making. *Qualitative Research in Financial Markets*, 8(4), 270–287.
- Liang, Z. & Qamruzzaman, M.** (2022). An Asymmetric Investigation of the Nexus Between Economic Policy Uncertainty, Knowledge Spillover, Climate Change, and Green Economy: Evidence from BRIC Nations. *Frontiers in Environmental Science*, 682.
- Liersch, M.** (2015). Women and investing: A behavioral finance perspective. *Merrill Lynch Whitepaper*. Available at: https://www.wrapmanager.com/hubfs/MM_Commentary_PDFs/Merrill_Lynch_Women_Investing_A%20Behavioral_Finance%20Perspective.pdf, Last accessed on 14th of March, 2023.
- Lin, H. W.** (2011). Elucidating the influence of demographics and psychological traits on investment biases. *International Journal of Economics and Management Engineering*, 5(5), 424–429.
- Madaan, G. & Singh, S.** (2019). An analysis of behavioral biases in investment decision-making. *International Journal of Financial Research*, 10(4), 55–67.
- Maier, J., Maier, M., Rattinger, H.** (2000). *Methoden der sozialwissenschaftlichen Datenanalyse: Arbeitsbuch mit Beispielen aus der politischen Soziologie*.
- Mertzanis, C. & Allam, N.** (2018). Political instability and herding behaviour: Evidence from Egypt's stock market. *Journal of Emerging Market Finance*, 17(1), 29–59.
- Mitroi, A. & Stancu, I.** (2014). Biases, Anomalies, Psychology of a Loss and Individual Investment Decision Making. *Economic Computation & Economic Cybernetics Studies & Research*, 48(1).
- Niehaus, G. & Shrider, D.** (2014). Framing and the disposition effect: evidence from mutual fund investor redemption behaviour. *Quantitative Finance*, 14(4), 683–697.
- Odean, T.** (1998). Volume, volatility, price, and profit when all traders are above average. *The Journal of Finance*, 53(6), 1887–1934.
- Owusu, S. P. & Laryea, E.** (2022). The impact of anchoring bias on investment decision-making: evidence from Ghana. *Review of Behavioral Finance*.
- Park, M.** (2023). Overconfidence Bias. Available at: <https://corporatefinanceinstitute.com/resources/capital-markets/overconfidence-bias/>, Last accessed on 13th of March 2023
- Philippas, N., Economou, F., Babalos, V., Kostakis, A.** (2013). Herding behavior in REITs: Novel tests and the role of financial crisis. *International Review of Financial Analysis*, 29, 166–174.
- Pompian, M. M.** (2011). *Behavioral finance and wealth management: how to build investment strategies that account for investor biases*. John Wiley & Sons.
- Pompian, M. M.** (2012). *Behavioral finance and investor types: managing behavior to make better investment decisions*. John Wiley & Sons.
- Pronin, E., Lin, D. Y., Ross, L.** (2002). The bias blind spot: Perceptions of bias in self versus others. *Personality and Social Psychology Bulletin*, 28(3), 369–381.

- Putri, L. P., Christiana, I., Kalsum, U., Widya, W., Justianti, M.** (2021). The Influence of Financial Literacy on Investment Decisions During the Pandemic. In *Journal of International Conference Proceedings (JICP)*, 4(2), 301–308.
- Rajdev, A. A. & Raninga, M. A. M.** (2016). Gender and heuristic driven biases: A review of literature. *International Journal of Commerce, Business and Management*, 5(3), 35–38.
- Rasmussen, A. E.** (2017). What is the biggest loss you have suffered in the stock market, and how do you recover it? Available at: <https://qr.ae/prUMez>. Last accessed on 14th of April, 2023.
- Ricciardi, V. & Simon, H.K.** (2000). *What is Behavioral Finance? Business, Education & Technology Journal*, 2 (2), 1–9.
- Roider, A. & Voskort, A.** (2016). Reputational herding in financial markets: A laboratory experiment. *Journal of Behavioral Finance*, 17(3), 244–266.
- Saldanha, R.** (2021). Investment Horror Stories – And the Lessons They Teach. Available at: <https://www.morningstar.ca/ca/news/216228/investment-horror-stories---and-the-lessons-they-teach.aspx>. Last accessed on 14th of April, 2023.
- Sharma, A. J.** (2016). Role of behavioural finance in the financial market. *International Journal of Business and Management Invention*, 5(1), 1–5.
- Shefrin, H. M. and Thaler, R. H.** (1988). The behavioral life-cycle hypothesis. *Economic Inquiry*, 26(4), 609–643.
- Shiller, R. J.** (1999). Human behavior and the efficiency of the financial system. *Handbook of macroeconomics*, 1, 1305–1340.
- Shin, H. & Park, S.** (2018). Do foreign investors mitigate anchoring bias in stock market? Evidence based on post-earnings announcement drift. *Pacific-Basin Finance Journal*, 48, 224–240.
- Singh, S. & Nag, A.** (2016). The role of behavioral finance in modern age investment. *Journal of Management and Science*, 6(1), 135–149.
- Sinha, P. C.** (2015). Stocks' pricing dynamics and behavioral finance: A review. *Management Science Letters*, 5(9), 797–820.
- Siniscalco, M. T. & Auriat, N.** (2005). Questionnaire design: Quantitative research methods in educational planning. International Institute for Educational Planning *UNESCO*, 8, 23–25.
- Slovic, P.** (1972). Psychological study of human judgment: Implications for investment decision making. *The Journal of Finance*, 27(4), 779–799.
- Spyrou, S.** (2013). Herding in financial markets: A review of the literature. *Review of Behavioral Finance*, 5(2), 175–194.
- Talpsepp, T. & Tänav, A. L.** (2021). Do gender, age and education affect herding in the real estate market? *Journal of Behavioral and Experimental Finance*, 32, 100571.
- Thaler, R.** (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, 1(1), 39–60.
- Thaler, R. H.** (1999). The end of behavioral finance. *Financial Analysts Journal*, 55(6), 12–17.
- Tseng, S.-Y. & Yang, C.** (2011). The role of information searches in investment choice variation: Digital information, advice seeking and heuristics. *African Journal of Business Management*, 5(12), 4934–4944.

- Tversky, A. & Kahneman, D.** (1971). Belief in the law of small numbers. *Psychological bulletin*, 76(2), 105.
- Tversky, A. & Kahneman, D.** (2013). Choices, values, and frames. *Handbook Of The Fundamentals Of Financial Decision Making (In 2 Parts)*, 4, 269.
- Venezia, I., Nashikkar, A., Shapira, Z.** (2011). Firm specific and macro herding by professional and amateur investors and their effects on market volatility. *Journal of Banking & Finance*, 35(7), 1599–1609.
- VRD Nation** (2021). Anchoring Bias in Stock Market. Available at: <https://www.vrdnation.com/anchoring-bias-in-stock-market>. Last accessed on 25th of March, 2023.
- Walters, D. J., Fernbach, P. M., Fox, C. R. & Sloman, S. A.** (2017). Known unknowns: A critical determinant of confidence and calibration. *Management Science*, 63(12), 4298–4307.
- Wong, A. & Nwude, C.** (2018). Investment Psychological Biases in The Unified States and Nigeria. *International Journal of the Academic Business World*, 15.
- Wright, W. F. & Anderson, U.** (1989). Effects of situation familiarity and financial incentives on use of the anchoring and adjustment heuristic for probability assessment. *Organizational Behavior and Human Decision Processes*, 44(1), 68–82.
- Yu, H., Dan, M., Ma, Q., Jin, J.** (2018). They all do it, will you? Event-related potential evidence of herding behavior in online peer-to-peer lending. *Neuroscience letters*, 681, 1–5.
- Yuliawati, T., Sari, M., Siska, Y. N.** (2021). Gender Differences in Investment Biases. In *5th Global Conference on Business, Management and Entrepreneurship (GCBME 2020)*, 187, 62–65.
- Zainul, Z. R. & Suryani, I.** (2021). Identification of Herding Behavior, Overconfidence and Risk Tolerance Based on Gender Perspective on Stock Investors in Aceh. 6th International Conference on Tourism, Economics, Accounting, Management, and Social Science (TEAMS 2021). *Advances in Economics, Business and Management Research*, 197, 157–164.
- Zahera, S. A. & Bansal, R.** (2018). Do investors exhibit behavioral biases in investment decision making? A systematic review. *Qualitative Research in Financial Markets* 10(2), 210–251.
- Zheng, Z., Tang, K., Liu, Y., Guo, J. M.** (2021). Gender and herding. *Journal of Empirical Finance*, 64, 379–400.
- Zong, Y. & Guo, X.** (2022). An experimental study on anchoring effect of consumers' price judgment based on consumers' experiencing scenes. *Frontiers in Psychology*, 13, 794135.

Acknowledgement

The result was created by solving the student project "Financial sector in the third decade of the 21st century" using objective-oriented support for specific university research from the University of Finance and Administration.

Contact Address

Bastian Schulz, MBA (PhD. Candidate)

Liliencronstraße 89

22149 Hamburg

Germany

(37212@mail.vsfs.cz)